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MYOCARDIAL FIBROSIS QUANTIFIED BY CMR EXTRACELLULAR VOLUME FRACTION PREDICTS MORTALITY AND DETECTS RESPONSE TO THERAPY IN THE NON-ISCHEMIC PATIENT POPULATION

Moderated Poster Contributions
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Background: Myocardial fibrosis expands the extracellular matrix (ECM) adversely affecting mechanical, electrical, and vasomotor function. We quantified ECM expansion, evaluated its association with mortality in the non-ischemic patient population, and assessed the impact of renin angiotensin aldosterone system (RAAS) inhibition on ECM expansion.

Methods: We studied 843 consecutive patients presenting for cardiovascular magnetic resonance (CMR) without evidence of coronary artery disease or amyloidosis. We computed extracellular volume fraction (ECV) from measures of hematocrit and pre- and post-contrast (0.2 mmol/kg gadoteridol bolus) T1 measures of myocardium and blood using modified Look-Locker inversion recovery (MOLLI) pulse sequences.

Results: There were 37 deaths over a median follow-up of 1.3 (IQR 0.8-1.8) years. ECV ranged from 18 to 48%. In multivariable Cox regression models ECV was the strongest predictor of all-cause mortality (HR 1.56, 95%CI 1.29-1.88 per 3% increase), stratifying by gender and late gadolinium enhancement and further adjusting for ejection fraction, age, and diabetes. RAAS inhibition was associated with 0.7% lower ECV in multivariable linear regression models (t value 2.2, p=0.04) after extensive risk adjustment.

Conclusions: ECV predicts mortality in the non-ischemic patient population. ECV can detect the effects of RAAS inhibition on ameliorating ECM expansion. ECV may be a novel tool to stratify risk and monitor response to treatment.